©TOM ROSTER'S 2013 NONTOXIC SHOT LETHALITY TABLE©

Large Geese At Long Range So-65 Steel BBB to T HEVI-Shot 2 to B 1-1/2 1-2 50-55 Improved Modified Improved Modified Improved Modified Improved Modified Improved Modified Improved Cylinder, Modified Improved Modified, Full Improved Modified,	Proven Nontoxic Shot Loads For Waterfowl & Upland Game Birds ¹ Load Velocity: 1,225 - 1,600 FPS ACTIVITY	Typical Shooting Range of Activity (Yards)	Most Effective Nontoxic Shot Size(s) For Birds Listed Under ACTIVITY At The Distances Listed In The Second Column	Minimum Load Weight (Ounces)	Minimum Pellet Hits Needed on Lethal Areas for Clean Kills	Minimum Pattern Count Needed at Any Distance for Clean Kills (# of Pellets in 30" Circle)	Most Effective Choke(s) (Given in Lead Shot Choke Designations)	NOTE: The pellets in the steel shot loads listed in this table were traditional, highly spherical ball-shaped pellets of ~ 7.86 g/cc density and 90-95 DPH hardness. The HEVI-Shot pellets were of 12.0 g/cc density and slightly harder than traditional steel pellets.
Large Geese Over Decoys 35-50 35-50 HEVI-Shot 2 to B 1-1/4 1-2 50-55 Improved Cylinder, Modified Improved Cylinder, Modified Improved Modified, Full 1-2 60-65 Improved Modified, Full 1-2 60-65 Improved Modified Improved Cylinder, Modified Improved Modified, Full Improved Modified,	Large Geese At Long Range	50-65	Steel BBB to T	1-1/4	1-2	50-55		
Medium/Small Geese Long Range Snow, White-fronted, Lesser Canadas So-65 Steel BB to BBB 1-1/4 1-2 60-65 Improved Modified Improved Modified, Full Medium/Small Geese Over Decoys 35-50 Steel 2 to BB 1-1/8 1-2 60-65 Improved Modified, Full Medium/Small Geese Over Decoys 35-50 Steel 2 to BB 1-1/8 1-2 60-65 Improved Modified, Modified Improved Cylinder, Modified Improved Modified, Full Im	Giant, Western, Atlantic and Interior Canadas	50-70	HEVI-Shot 2 to B	1-1/2		50-55	•	
Medium/Small Geese Long Range 50-65 Steel BB to BBB 1-1/4 1-2 60-65 Improved Modified Snow, White-fronted, Lesser Canadas 50-65 HEVI-Shot 2 1-1/2 1-2 60-65 Improved Modified Medium/Small Geese Over Decoys 35-50 Steel 2 to BB 1-1/8 1-2 60-65 Light Modified, Modified Large Ducks At Long Range 45-65 Steel 2 to 1 1-1/8 1-2 85-90 Improved Modified, Full Mallard, Black, Pintail, Goldeneye, Gadwall 45-65 HEVI-Shot 4 1-1/4 1-2 85-90 Improved Modified, Full Large Ducks Over Decoys 20-45 Steel 6 to 2 3/-1 1-2 85-90 Improved Modified, Full Large Ducks Over Decoys 20-45 Steel 6 to 2 3/-1 1-2 85-90 Improved Modified, Full Large Ducks Over Decoys 20-45 Steel 6 to 2 3/-1 1-2 85-90 I.C. (20-35 Yds), Mod. (35-45 Yds) Medium Ducks Over Decoys 20-45 Steel 6 to 3 1 1-2 115-120 I.C. (20-35 Yds), Mod. (35-45 Yds)	Large Geese Over Decoys	35-50	Steel BB to BBB	1-1/4	1-2	50-55	Improved Cylinder, Modified	
Show, White-fronted, Lesser Canadas 50-65 HEVI-Shot 2 1-1/2 1-2 60-65 Improved Modified, Full		35-50	HEVI-Shot 2 to B	1-1/2	1-2	50-55	Improved C	ylinder, Modified
Medium/Small Geese Over Decoys 35-50 Steel 2 to BB HEVI-Shot 4 to 2 1-1/8 1-2 60-65 lmproved Cylinder, Modified lmproved Modified, Full lmproved Modified	Medium/Small Geese Long Range	50-65	Steel BB to BBB	1-1/4	1-2	60-65	-	
Large Ducks At Long Range A5-65 Steel 2 to 1 1-1/4 1-2 85-90 Improved Cylinder, Modified HEVI-Shot 4 1-1/4 1-2 85-90 Improved Modified, Full HEVI-Shot 4 1-1/4 1-2 85-90 Improved Modified, Full HEVI-Shot 4 1-1/4 1-2 85-90 Improved Modified, Full HEVI-Shot 6 to 4 1-1/4 1-2 85-90 I.C. (20-35 Yds), Mod. (35-45 Yds) HEVI-Shot 6 to 4 1-1/8 1-2 85-90 I.C. (20-35 Yds), Mod. (35-45 Yds) HEVI-Shot 6 to 4 1-1/8 1-2 85-90 I.C. (20-35 Yds), Mod. (35-45 Yds) Medium Ducks Over Decoys 20-45 Steel 6 to 3 1 1-2 115-120 I.C. (20-35 Yds), Mod. (35-45 Yds) Wigeon, Scaup, Shoveler 20-45 Steel 6 to 4 1-1/8 1-2 115-120 I.C. (20-35 Yds), Mod. (35-45 Yds) Small Ducks Over Decoys 20-45 Steel 6 to 4 1 1-2 135-145 Mod. (20-35 Yds), Full (35-45 Yds) Teal, Ruddy, Bufflehead 20-45 HEVI-Shot 6 to 4 1-1/8 1-2 135-145 Mod. (20-35 Yds), Full (35-45 Yds) Ring-Necked Pheasants 20-50 Steel 3 to 2 1 2-3 90-95 I.C. (20-30 Yds), Mod. (30-50 Yds) I.C. (20-30 Yds), Mod. (30-50 Yds) Turkeys (Head and Neck Shots) 20-40 Steel 4 1-1/4 3-4 210-230 Full or Extra Full Northern Bobwhite Quail 20-30 Steel 7 5/8 1-2 170-190 Imp. Cyl., Light Modified	, , , , , , , , , , , , , , , , , , ,	50-65	HEVI-Shot 2	1-1/2	1-2	60-65	Improved Modified, Full	
Large Ducks At Long Range 45-65 Steel 2 to 1 1-1/8 1-2 85-90 Improved Modified, Full Improved Mod	Medium/Small Geese Over Decoys	35-50	Steel 2 to BB	1-1/8	1-2	60-65	Light Modified, Modified	
Mallard, Black, Pintail, Goldeneye, Gadwall 45-65 HEVI-Shot 4 1-1/4 1-2 85-90 Improved Modified, Full Large Ducks Over Decoys 20-45 Steel 6 to 2 3/4 - 1 1-2 85-90 I.C. (20-35 Yds), Mod. (35-45 Yds) Medium Ducks Over Decoys 20-45 Steel 6 to 3 1 1-2 85-90 I.C. (20-35 Yds), Mod. (35-45 Yds) Wigeon, Scaup, Shoveler 20-45 Steel 6 to 3 1 1-2 115-120 I.C. (20-35 Yds), Mod. (35-45 Yds) Small Ducks Over Decoys 20-45 Steel 6 to 4 1 1-2 135-145 Mod. (20-35 Yds), Full (35-45 Yds) Teal, Ruddy, Bufflehead 20-45 HEVI-Shot 6 1-1/8 1-2 135-145 Mod. (20-35 Yds), Full (35-45 Yds) Ring-Necked Pheasants 20-50 Steel 3 to 2 1 2-3 90-95 I.C. (20-30 Yds), Mod. (30-50 Yds) Turkeys (Head and Neck Shots) 20-40 Steel 4 1-1/4 3-4 210-230 Full or Extra Full Northern Bobwhite Quail 20-30 Steel 7 5/8 1-2 170-190 Imp. Cyl., Light Modified<		35-50	HEVI-Shot 4 to 2	1-1/4	1-2	60-65	Improved C	ylinder, Modified
Large Ducks Over Decoys 20-45 Steel 6 to 2 20-45 % - 1 1-2 85-90 I.C. (20-35 Yds), Mod. (35-45 Yds) Medium Ducks Over Decoys 20-45 Steel 6 to 3 1 1-1/8 1-2 115-120 1.C. (20-35 Yds), Mod. (35-45 Yds) Wigeon, Scaup, Shoveler 20-45 Steel 6 to 4 1-1/8 1-2 115-120 1.C. (20-35 Yds), Mod. (35-45 Yds) Small Ducks Over Decoys 20-45 Steel 6 to 4 1 1-2 135-145 115-120 Mod. (20-35 Yds), Full (35-45 Yds) Teal, Ruddy, Bufflehead 20-45 HEVI-Shot 6 1-1/8 1-2 135-145 Mod. (20-35 Yds), Full (35-45 Yds) Ring-Necked Pheasants 20-50 20-50 HEVI-Shot 6 to 4 1-1/8 2-3 90-95 I.C. (20-30 Yds), Mod. (30-50 Yds) I.C. (20-30 Yds), Mod. (30-50 Yds) Turkeys (Head and Neck Shots) 20-40 Steel 4 1-1/4 3-4 210-230 Full or Extra Full Northern Bobwhite Quail 20-30 Steel 7 5/8 1-2 170-190 Imp. Cyl., Light Modified	Large Ducks At Long Range	45-65	Steel 2 to 1	1-1/8	1-2	85-90	Improved N	lodified, Full
Medium Ducks Over Decoys 20-45 Steel 6 to 3 1 1-2 115-120 I.C. (20-35 Yds), Mod. (35-45 Yds)	Mallard, Black, Pintail, Goldeneye, Gadwall	45-65	HEVI-Shot 4	1-1/4	1-2	85-90	Improved Modified, Full	
Medium Ducks Over Decoys 20-45 Steel 6 to 3 1 1-2 115-120 I.C. (20-35 Yds), Mod. (35-45 Yds) Wigeon, Scaup, Shoveler 20-45 HEVI-Shot 6 to 4 1-1/8 1-2 115-120 I.C. (20-35 Yds), Mod. (35-45 Yds) Small Ducks Over Decoys 20-45 Steel 6 to 4 1 1-2 135-145 Mod. (20-35 Yds), Full (35-45 Yds) Teal, Ruddy, Bufflehead 20-45 HEVI-Shot 6 1-1/8 1-2 135-145 Mod. (20-35 Yds), Full (35-45 Yds) Ring-Necked Pheasants 20-50 Steel 3 to 2 1 2-3 90-95 I.C. (20-30 Yds), Mod. (30-50 Yds) HEVI-Shot 6 to 4 1-1/8 2-3 90-95 I.C. (20-30 Yds), Mod. (30-50 Yds) Turkeys (Head and Neck Shots) 20-40 Steel 4 1-1/4 3-4 210-230 Full or Extra Full Northern Bobwhite Quail 20-30 Steel 7 5/8 1-2 170-190 Imp. Cyl., Light Modified	Large Ducks Over Decoys	20-45	Steel 6 to 2	3/4 - 1	1-2	85-90	•	• • • • • • • • • • • • • • • • • • • •
Wigeon, Scaup, Shoveler 20-45 HEVI-Shot 6 to 4 1-1/8 1-2 115-120 I.C. (20-35 Yds), Mod. (35-45 Yds) Small Ducks Over Decoys 20-45 Steel 6 to 4 1 1-2 135-145 Mod. (20-35 Yds), Full (35-45 Yds) Teal, Ruddy, Bufflehead 20-45 HEVI-Shot 6 1-1/8 1-2 135-145 Mod. (20-35 Yds), Full (35-45 Yds) Ring-Necked Pheasants 20-50 Steel 3 to 2 1 2-3 90-95 I.C. (20-30 Yds), Mod. (30-50 Yds) Pull Or Extra Full Northern Bobwhite Quail 20-40 Steel 4 1-1/4 3-4 210-230 Full or Extra Full Northern Bobwhite Quail 20-30 Steel 7 5/8 1-2 170-190 Imp. Cyl., Light Modified		20-45	HEVI-Shot 6 to 4	1-1/8	1-2	85-90	I.C. (20-35 Ye	ds), Mod. (35-45 Yds)
Small Ducks Over Decoys 20-45 Steel 6 to 4 1 1-2 135-145 Mod. (20-35 Yds), Full (35-45 Yds) Teal, Ruddy, Bufflehead 20-45 HEVI-Shot 6 1-1/8 1-2 135-145 Mod. (20-35 Yds), Full (35-45 Yds) Ring-Necked Pheasants 20-50 Steel 3 to 2 1 2-3 90-95 I.C. (20-30 Yds), Mod. (30-50 Yds) LC. (20-30 Yds), Mod. (30-50 Yds) I.C. (20-30 Yds), Mod. (30-50 Yds) I.C. (20-30 Yds), Mod. (30-50 Yds) Turkeys (Head and Neck Shots) 20-40 Steel 4 1-1/4 3-4 210-230 Full or Extra Full Northern Bobwhite Quail 20-30 Steel 7 5/8 1-2 170-190 Imp. Cyl., Light Modified	Medium Ducks Over Decoys	20-45	Steel 6 to 3	1	1-2	115-120	`	,, ,
Teal, Ruddy, Bufflehead 20-45 HEVI-Shot 6 1-1/8 1-2 135-145 Mod. (20-35 Yds), Full (35-45 Yds) Ring-Necked Pheasants 20-50 Steel 3 to 2 HEVI-Shot 6 to 4 1 2-3 90-95 I.C. (20-30 Yds), Mod. (30-50 Yds) Turkeys (Head and Neck Shots) 20-40 Steel 4 1-1/4 3-4 210-230 Full or Extra Full Northern Bobwhite Quail 20-30 Steel 7 5/8 1-2 170-190 Imp. Cyl., Light Modified	Wigeon, Scaup, Shoveler	20-45	HEVI-Shot 6 to 4	1-1/8	1-2	115-120	I.C. (20-35 Ye	ds), Mod. (35-45 Yds)
Ring-Necked Pheasants 20-50 20-50 Steel 3 to 2 20-50 1 2-3 90-95 1.C. (20-30 Yds), Mod. (30-50 Yds) 1.C. (20-30 Yds), Mod. (30-50 Yds) Turkeys (Head and Neck Shots) 20-40 Steel 4 1-1/4 3-4 210-230 Full or Extra Full Northern Bobwhite Quail 20-30 Steel 7 5/8 1-2 170-190 Imp. Cyl., Light Modified	Small Ducks Over Decoys	20-45	Steel 6 to 4	1	1-2	135-145	•	,,
20-50 HEVI-Shot 6 to 4 1-1/8 2-3 90-95 I.C. (20-30 Yds), Mod. (30-50 Yds) Turkeys (Head and Neck Shots) 20-40 Steel 4 1-1/4 3-4 210-230 Full or Extra Full Northern Bobwhite Quail 20-30 Steel 7 5/8 1-2 170-190 Imp. Cyl., Light Modified	Teal, Ruddy, Bufflehead	20-45	HEVI-Shot 6	1-1/8	1-2	135-145	Mod. (20-35	Yds), Full (35-45 Yds)
20-50 HEVI-Shot 6 to 4 1-1/8 2-3 90-95 I.C. (20-30 Yds), Mod. (30-50 Yds) Turkeys (Head and Neck Shots) 20-40 Steel 4 1-1/4 3-4 210-230 Full or Extra Full Northern Bobwhite Quail 20-30 Steel 7 5/8 1-2 170-190 Imp. Cyl., Light Modified	Ring-Necked Pheasants	20-50	Steel 3 to 2	1	2-3	90-95		
Northern Bobwhite Quail 20-30 Steel 7 5/8 1-2 170-190 Imp. Cyl., Light Modified		20-50	HEVI-Shot 6 to 4	1-1/8	2-3	90-95	I.C. (20-30 Yds	s), Mod. (30-50 Yds)
	Turkeys (Head and Neck Shots)	20-40	Steel 4	1-1/4	3-4	210-230	Full or Extra	a Full
Swatter Load For Wounded Birds 20-30 Steel 7 to 6 1 1 175 Improved Modified, Full	Northern Bobwhite Quail	20-30	Steel 7	5/8	1-2	170-190	Imp. Cyl., Light Modified	
	Swatter Load For Wounded Birds	20-30	Steel 7 to 6	1	1	175	Improved N	lodified, Full

This table summarizes Tom Roster's analyses to date of the waterfowl lethality data bases for certain of the 15 U.S. steel versus lead waterfowl shooting tests run between 1968 & 1982 & one steel-only pheasant shooting test plus lethality data bases owned by ammunition companies for birds taken with nontoxic shotshell loads Roster tested for them & the CONSEP organization.

Note: Steel #BBB (.190") and HEVI-Shot #2 (.150") have exhibited the best all-around performance for taking geese; steel #3 (.140") and HEVI-Shot #4 (.130") the best all-around performance for taking ducks; and steel #2 and HEVI-Shot #4 the best all-around performance for taking ring-necked pheasants.

¹These findings are derived from testing 3" 20 gauge; 2³/4", 3" and 3½" 12 gauge; and 3½" 10 gauge steel loads; plus 3" 20 gauge and 2¾" and 3" 12 gauge HEVI-Shot loads.
© Copyright 2013 by Tom Roster. For answers to questions on this table contact: Tom Roster, 1190 Lynnewood, Klamath Falls, OR, USA 97601. tomroster@charter.net